NOTE XXXVII.

ON STREPSICEROS KUDU AND STREPSICEROS IMBERBIS.

BY

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(Plate 9).

In a »notice of two overlooked species of Antelope" by Mr. Edward Blyth (P. Z. S. L. 1869) we read on p. 55 the following passage: »Dr. Gray, in his »List of specimens »of Mammalia in the British Museum" (1850, p. 143), »under *Strepticeros kudu* notices »Var. smaller. Inhabits »Abyssinia; Mus. E. I. C.; Mus. Frankfort, adult and »young." I consider this small kudu, of which adults of »both sexes are figured and described by Sir Andrew »Smith, to be decidedly a well-marked species; and there»fore I now propose for it the name of *Strepticeros imberbis.*"

As Dr. Gray did not publish in 1850 a book entitled »List of specimens of Mammalia in the British Museum", Mr. Blyth apparently meant herewith the well-known »Catalogue of the specimens of Mammalia in the collection of the British Museum" published by Dr. Gray in 1852; and here we find on p. 134 (not 143 Blyth) under the head *Strepsiceros* (not *Strepticeros* Blyth) *kudu*: »var. 1. Smaller. — *Mus. Ind. Comp. Lond. and Frankfort.* Antilope Tendall[1], *Rüppell*, *Abyssinia*, 22; *Fischer*, *Syn.* 475.

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[1] *Tendal* (not *Tendall* Gray) is the name given by the Arabs (Cf. Rüppell's Atlas, 1826, p. 22) to an *Antilope*, described by Rüppell as follows: „Grösse

Antilope chora, *Rüppell*, *Abyssinia*, 22; *Fischer*, *Syn.* 475. Hab. Abyssinia."

If Mr. Blyth merely had read Smith's description above mentioned and compared it with Smith's figures of ♂ and ♀ of *Damalis (Strepsiceros) capensis*, he certainly would not have suggested that these figures truly represented adult specimens of his new species, *Strepsiceros* (not *Strepticeros* Blyth) *imberbis*, and Mr. Blyth is not quite right where he writes, l. c. p. 52, that the male figured by Smith shows *not a trace* of the fringe of long hairs down the front of the neck with which the male of the *Strepsiceros kudu* so copiously is adorned; I remark that the figure shows correctly, although feebly, the named fringe down the front of the neck, and that Smith described it very correctly in the following terms: »the neck is robust, rather long, *fringed both above and below*, with some long and coarse hair which superiorly forms a sort of mane, about three and a half inches high and which extends from the base of the horns to the hinder edge of the shoulders; *inferiorly the long hair is irregularly disposed and forms a thin shaggy coating to the throat.*"

Like Mr. Blyth in 1869 so Dr. Sclater in 1884 overlooked Smith's accurately drawn description and apparently too was induced in error by the but feebly represented fringe in the figure. Dr. Sclater however seems to have been in dubio, for he wrote (P. Z. S. L. 1884, p. 48): »Whether *Damalis capensis* as represented on plate 42 of Smith's illustrations really belongs to *S. imberbis*, as supposed by Blyth, is, I think, very doubtful. *It is true*, *the neck has no fringe*, but the horns have the open spiral of *S. kudu*

eines Pferdes; Hörner schwarz und gewunden, wie bei den *Addax*, aber viel grösser und dicker; Hauptfarbe rothbraun;' Stirn schwarz; Hinterfüsse schwärzlich; Schwanzquaste sehr lang." Notwithstanding Rüppell in his »Neue Wirbelthiere" 1835—40, p. 26, said that *Tendal* is the name given by the Arabs to *Strepsiceros kudu* which has a „Haarkamm längs des ganzen Vorderhalses", Gray called in 1852 and later in his Handlist, 1873, always the *Str. imberbis*, *Str. tendal.*

and, so far as we know at present, *S. imberbis* is only met with for certain in Somali-land."

As I hope to demonstrate, the form, position and length of the horns just are striking proofs that Smith's *Damalis capensis* was a true *Strepsiceros kudu*. Although we find some figures and measurements of horns by Gray, Blyth, Smith, Sclater and others, nobody hitherto has paid attention to the great variation in position of those parts, nor to their form if very adult; therefore nearly never the given figures agree with their measurements or inversely. And as the proportion between the distance of the points of the horns and their length changes with the age of the individual and moreover is not constant in the individuals of the same age, so it is evident that measurements without figure or without nearer description of the form of the horn have no value at all. But if figures of a pair of horns are given, it therefore is a desideratum that they should agree with the measurements exhibited in the text. In this point, however, our *kudu* has been very unfortunate: so Smith said that of his *D. capensis* the length of the horns was 3 feet and the distance between the horns at points 2 feet 7 inches; the proportion being thus 1 to 0.86, meanwhile the proportion in the figure (nearly front view of the horns) is about 1 to 0.6! So in Sclater's figure, P. Z. S. L. 1884, p. 47, fig. 2 (*not* fig. 1 to bottom of that page), of the horns of *Str. kudu* the proportion is 1 to 0.7, meanwhile the proportion between the measurements on p. 46 is 1 to 1.06! In both cases the reader is in dubio.

There are two fine drawings of head with horns of *Str. kudu* on plate II of Fr. Courteney Selous' »A hunter's wanderings in Africa, 1890". He merely records the length of the horns and it therefore is impossible to know if they have been represented in a natural and true position.

There are in our Museum a large series of fine Koodoo-horns, some of which have been drawn on plate 9 after photographs. This series will clearly demonstrate the enormous variation in general form of the horns and at the same time show the variation due to age.

The measurements of the horns figured on plate 9 are the following (in Centimeters):

	Length	Distance	Proportion
l. (Cat. Ost. 1887, p. 140)	79	70	1: 0.88
g. " " " " "	99	80	1: 0.81
k. " " " " "	93	50	1: 0.54
n. " " " " "	73	79	1: 1.08
c. " " " " "	97	110	1: 1.13

The most developed horn of the Koodoo presents two arches on both sides of the horn, therefore the figure given by Sclater (P. Z. S. L. 1884) and those on plate 9, figs. *g* and *k*, represent horns of very adult specimens; the horns figured by Smith, Blyth (P. Z. S. L. 1869, fig. 1) and on plate 9, *c*, represent a younger stadium, meanwhile the figures by Blyth (l. c. fig. 2) and on plate 9, *l* and *n*, represent half grown horns. From the named figures it will be clear to understand how the proportion between the length of the horns and the distance of their points must vary with the different age of the same individual, and alternately must increase and decrease according to age.

If we carefully study the figures on plate 9 we recognize as it were three different types, one represented by *k* slender and elegant, one represented by *c* very broadly developed horns of a very great size, and finally the form represented by *g* somewhat intermediate between *k* and *c*, longer but less slender than *k*, not so strongly developed but more elegant than *c*; *l* shows the halfgrown stadium of *g* and *n* the halfgrown stadium of *c*.

The Lesser Koodoo (*Str. imberbis*) resembles a miniature specimen of stadium *k* if we look at the horns, and therefore its horns never can be confounded with those of Koodoos of the types *c*, *g* nor *k*, being slender and elegant like *k*, but always the very small size — nay if adult — gives the finishing stroke; moreover the *imberbis*-horns never show the open spiral so constant in the *kudu*, as already pointed out by Blyth, Sclater and others. Blyth, Sclater and Willoughby [1]) have published drawings of the horns of *Str. imberbis*: those given by Blyth, l. c. p. 54, represent loose horns and therefore learn nothing as to their position; the horn from base to tip measures 19$^1/_2$ inches in a straight line and the greatest width apart (at the tips) is 12 inches, the proportion thus 1 to 0.6; the horns are however those of a two-thirds grown specimen; Dr. Sclater's figure (l. c. p. 47, fig. 1, *not* fig. 2) accords very well with the measurements on p. 46, the proportion of the latter being 1 to 0.48 and of the former 1 to 0.44, the figure thus gives a very good impression of the relative position of the horns; Captain Willoughby gives the length of horns from base to tips in a straight line 17 inches, width between the tips 14 inches (see explanation of plate 1 [2]), the proportion thus being 1 to 0.82, in the figure (front view) however the proportion is 1 to 0.54! The reason is that the length of the horns is about half an inch too great in the figure, meanwhile the distance of the tips has been accurately drawn at $^1/_{15}$ natural size: in the side view (see the same plate) the horns have been drawn still longer! at about $^1/_{10}$ instead of $^1/_{15}$ natural size! It is a great pity that the named figures have not accurately been drawn, because they are hitherto the only figures of a head with horns of an adult Lesser Koodoo.

In the P. Z. S. L., 1884, is a beautifully colored plate of a young male specimen of the Lesser Koodoo (Plate IV) and our Museum has purchased a specimen of the same size which died some time ago in the London Zoological Gardens; according to Mr. Frank E. Beddard the locality of this specimen was Malindi, north of Mombas. As we possess also a young male specimen of about the same age of *Str. kudu*, I will try to trace the external differences between the two species in young condition and to compare as far as possible their skulls. As I am not happy enough to possess an adult skin nor adult skull of *Str. imberbis*, I am forced to confine myself to a mere comparative study of the young ones, the external form moreover and the color of *Str. kudu* have been so often described and there are specimens in so many Museums that this species in adult stage needs no new description, meanwhile the adult Lesser Koodoo seems not to differ very much from the young in color, as stated by Dr. Noack (Der Zoologische Garten, 1886, p. 40) who described one of Menges' *Aderio* or *Str. imberbis* as follows: »das Thier war ein noch nicht ganz erwachsenes Weibchen, welches in der Färbung genau mit dem Proc. Zool. Soc. London, 1884, abgebildeten Bock übereinstimmte. Die Rückenhöhe desselben betrug etwa 66 cm." A comparative description of the adult skull of *Str. imberbis* however remains still a desideratum.

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[1]) East Africa and its big game, by Captain Sir John C. Willoughby, Bart., 1889, plate 1, figs. 2, 2.

[2]) By a mistake apparently he calls here the Lesser Koodoo, *Str. kudu*, instead of *Str. imberbis*.

There is a young female specimen of *Str. kudu* figured in Gray's Knowsley's Menagerie, 1850, pl. 24, fig. 2, and the named author states, l. c. p. 26: »in the Frankfort Museum there is a male and female adult, a half-grown and young specimens; in the India House Museum is another specimen, all from Abyssinia. They do not appear to differ from the Cape specimens, except in being smaller." As the specimen from the India House Museum has turned out to be a true *imberbis*, Messrs. Gray, Blyth and Sclater had reason to suppose that there is in the Frankfort Museum a whole and complete series of this interesting species!

Dr. Noll at Frankfort, however, kindly furnished me with the following information: »Das Senckenbergische Museum zu Frankfurt a. M. besitzt 4 Kudu Antilopen, 1 ♂ und 2 ♀ ad. und 1 ♂ juv. Dieselben sind 1834 von Dr. Ed. Rüppell in Abyssinien' erlegt. ♂ und 1 ♀ sind gut behaart, das ♀ heller braun mit 8 weisslichen Streifen, das andere ♀ ist schlecht im Haar, die Streifen nur angedeutet, das Junge hat 5 Streifen, das alte ♂ 7 Streifen, wovon 3 auf den Hinterbacken. Die Nackenmähne ist bei den 3 ad. noch teilweise vorhanden, am meisten bei dem ♂. Dies allein hat *den starken Haarkamm an der Unterseite des Kopfes von dessen Mitte an und am Halse*, die ♀ nichts davon. *Bei dem Jungen ist er schon angedeutet;* wo er an den Vorderbeinen aufhört, beginnt bei dem Jungen ♂ eine schwarze Linie in der Mitte des Bauches, die sich vor dem Penis erweitert und einen ovalen weissen Fleck einschliesst. Die Länge der Hörner beträgt bei dem ♂ in gerader Linie 85 cm., der Kante auf den Windungen (Leiste) entlang 113 cm. Der Abstand der Spitzen der Hörner von einander ist 87 cm."

The above cited communication shows to evidence that the Frankfort specimens are true Koodoos, *Str. kudu*, as is indicated by the maned underparts of the neck, by the open spiral of the horns (113 cm.), and by the position of the horns which agrees nearly with the third type, distinguished by me on p. 214 (see plate 9, fig. *c*). The relative shortness (85 cm.) of the horns demonstrates that the specimen had not yet attained its full development, and so we understand how Gray could write of the Frankfort-Koodoos »*smaller*" (in Knowsley's Menagerie), but Gray, Blyth and Sclater were mistaken where they distinguished these specimens from the true *kudu*, under the name *tendal* or *imberbis.*

Our young male *Str. kudu* died in December 1878 in the Amsterdam Zoological Gardens; it is a little younger than our young *imberbis*-male, as its smaller horns and less developed dentition clearly demonstrate. Its greater size however immediately points out that it belongs to a form larger in every age.

Measurements in centimeters:	*kudu.*	*imberbis.*
Height at the shoulders	97	83
Length of horns	9	9
Distance between their tips	17.5	9
» » eye and end of muzzle	17	14
Length of ear	19	14
Circumference at base of horns	10	8

In a somewhat older male of *Str. kudu*, died in Amsterdam (March 1879) and at present in our Museum, the following dimensions are not without interest:

	cm.
Length of horns (no trace of spirature)	23
Distance between their tips	31
Circumference at the base	14

The horns of the young *kudu* are round at the base and show no trace of the well developed prominent angulation in the *imberbis* of about the same age and in the older *kudu*-specimen. Very remarkable is the different position of the horns with respect to the skull, resp. to the head; in the young *kudu* the horns are placed nearly in one plain with nose and forehead, about like in *Anoa depressicornis*, meanwhile in the young *imberbis* they form an angle with the head, about like in *Portax picta.*

The fur of the *imberbis* generally is much more lively colored, with a darker hue and the white stripes and ditto patches are more prominent. This darker hue results from the fact that the *kudu* has the hairs uniformly colored from base to tip, a few hairs having black tips, meanwhile in *imberbis*, with a few exceptions, all the hairs are black-tipped: moreover the brown color in *kudu* may be called a dirty rufous and in *imberbis* a fine chestnut.

The dark colored mane running from between the horns along the spine of the back pass away at a certain distance above the shoulders and is substituted by a pure white line ending at a short distance from the base of the tail: in our young *kudu* this white line is interrupted near its end by broad dark colored stripes.

From this white line descend the well known stripes, pure white and very striking in *imberbis*, dirty white and very indistinct, often nearly imperceptible, in *kudu*: the number of these stripes is very inconstant and is different on both sides in the same specimen, but always much greater in *imberbis* than in *kudu*: in our young *imberbis* there are 12 stripes on the right side and 13 on the left;

between them are spread some pure white spots especially on the thighs; our young *kudu* shows 6 indistinct stripes on each side, our old male has 9 and the female 6 stripes. Mr. Huet ascribes to the species »7 lignes verticales", Josef Menges 4—5, Dr. Noll 5, 7 and 8, Dr. Noack 7, Smith 7—8 in ♂, and in ♀ the number is generally greater, some of them occasionally bifurcate, and the white is less pure; Hamilton Smith (1827) assured that the ♂ has four or five white lines from behind the shoulders to the hips, and two, three or four more across the croup, forming in all eight or nine cross streaks, the ♀ is faintly marked with three or four cross lines on the sides and one or none on the thighs, meanwhile in the calves the marks are less perceptible; according to Schreber there are »7—9 mehr oder weniger deutliche, weisse Querstreifen an den beiden Seiten. Die Länge, Zahl und Vertheilung derselben ist abweichend, so wie auch selbst der weisse Streifen auf dem Rückengrath bisweilen gar nicht vorhanden ist. Die Seitenstreifen sind bei den Weibchen schwächer, auch scheinen sie sich überhaupt mit zunehmendem Alter zu vermindern. Bei einem jungen Ex. in der Par. Gallerie lassen sich 9 Seitenstreifen deutlich bemerken, bei einem ausgewachsenen sind nur 7 derselben vollkommen sichtbar, die drei übrigen kaum zu unterscheiden."

According to Dr. Sclater's figure in P. Z. S. L. 1884, there are in *imberbis* about 11 stripes, Josef Menges reports 12 to 15, Dr. Noack 11 to 13 and Mr. Huet 12.

In conclusion the number of white stripes in *kudu* never exceeds 10 and in *imberbis* always is greater than 10.

In *kudu* the throat is adorned with a mane, in *imberbis* with the well known two large pure white spots, but what is unknown and very interesting is that our young *kudu* shows a well developed fringe of hairs or mane, and at the same time represents the two white spots of the *imberbis*, although in smaller dimensions but on about the same place on the throat, and the mane hairs at these white spots are white colored, thus very strikingly contrasting with the more or less dark brown color of the rest of the mane.

Smith relates that »the sides of the head (of *Str. kudu*) are variegated with several small irregular white spots, one in front of each ear, one under each lower eyelid and one on each cheek." It seems to me that only two cheek-spots are rather constantly present as well in *kudu* as in *imberbis*, although in our halfgrown specimen of *kudu* no cheek-spots are perceptible, in our young *kudu* the left cheek only has one spot and Mr. Selous figures in his »Hunter's wanderings in Africa" two *kudu*-heads each with three cheek-spots: I suppose that we have here to do with abnormalities.

In our young *imberbis* the so very characteristic white angular line on the nose is not yet wholly developed, the top of the angle is wanting.

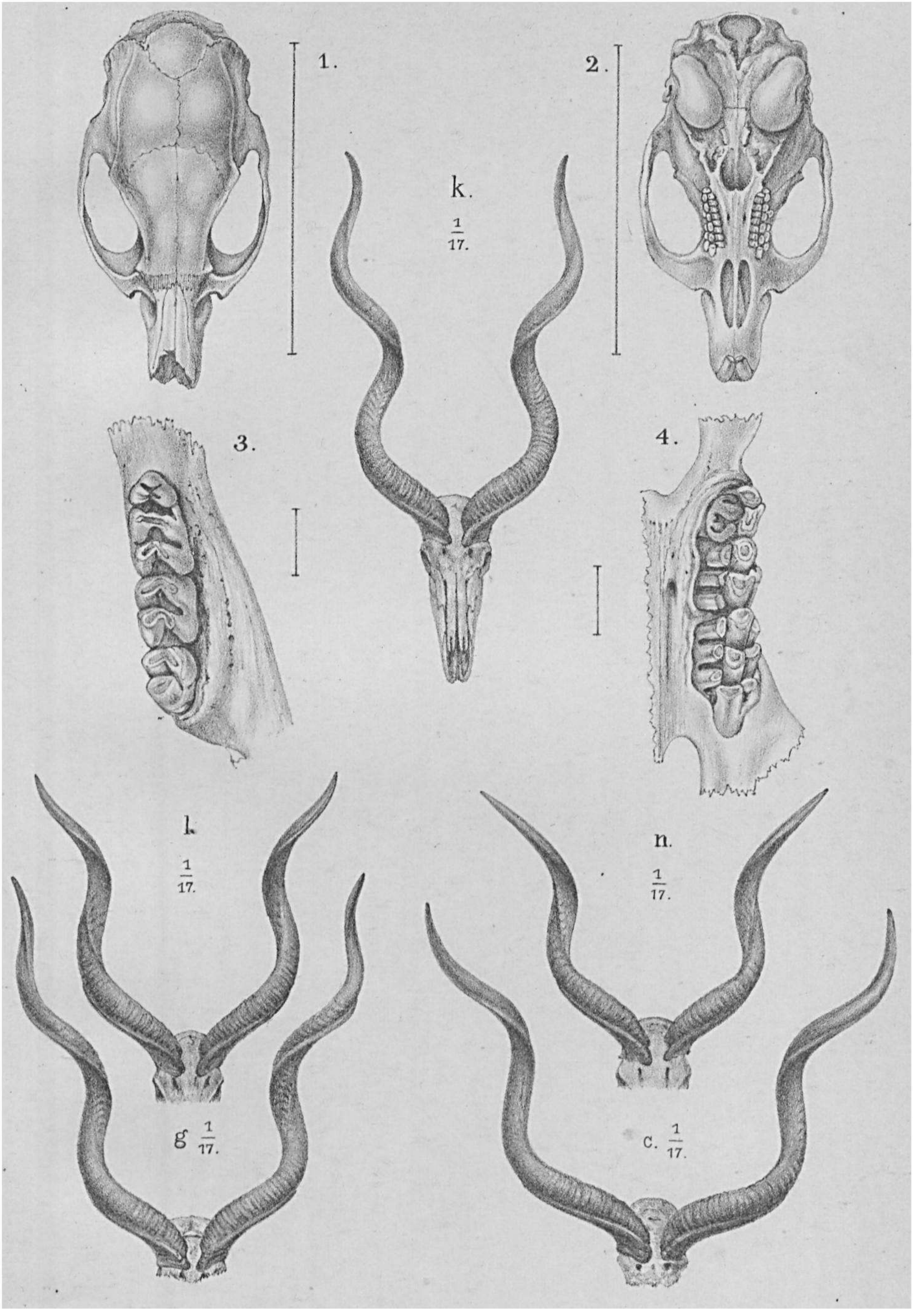
The tail near its basal part bears a pure white circle in our young *imberbis*, not present in our young *kudu*.

In the skulls of our young *kudu* and *imberbis* there are some striking features which I shortly wish to point out. The coronoid process is surprisingly much more arched and bent down in *kudu*; although the greatest length of the *kudu*-skull measures about 3 centimeters more than the same length in *imberbis*, the distance between the first upperpremolar and the end of the premaxilla differs only 3 millimeters in the two skulls; the *kudu* has the bony palate much more concave and this for a greater extent, and the hindmost part of the palate ends in *kudu* more in a curved line and in *imberbis* in a rather sharp angle.

In some Antelopes: *Anoa depressicornis*, *Kobus ellipsiprymnus*, *Aepyceros melampus*, *Euryceros euryceros*, *Tragelaphus sylvaticus* and *Oreas oreas*, each nasal bone presents a more or less deep incision, so that the nasal bones may be called bilobate: in *oreas* the incision is very deep, dividing that bone in a very elongate outer lobe and a shorter inner lobe. In *kudu* and *imberbis* the deep incision divides each nasal bone in two very elongate lobes of about the same length.

Str. kudu has been met with from Abyssinia to the Cape Colony, where it is still fairly abundant in the eastern province (see Bryden's Kloof and Karroo, 1889, p. 292); *kudu* and *imberbis* (according to Dr. Noack, der Zoologische Garten, 1886, p. 42) leben nebeneinander in den Gebirgen der Somalihalbinsel auf trocknem Felsboden; Josef Menges (Petermann's Mittheilungen, 1884, p. 408) reports »die kleine Kudu Antilope (Aderio) des Somalilandes ist im ganzen Gebirge noch zahlreicher als die grosse Art." From Somali-land the *imberbis* has been found southward to till the Juba River, as we know from a letter written to Dr. Sclater by Mr. F. Holmwood, Consul at Zanzibar (P. Z. S. L. 1884, p. 48) with the following note: »I have seen the dwarf-koodoo in the neighbourhood of the Juba River, which is exactly under the Equator."

In »Zoologischer Jahrbücher, 1887, p. 210" we find a very strange statement. Dr. Th. Noack relates: »*Streps. imberbis* kommt nach einem vom Prinzen Samson Dido nach Hamburg gebrachten Fell eines Pullus auch in *West*-Afrika vor."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1, 2 3, 4. Dr. H. W. de Graaf ad nat. del.
c, g, k, l, n. A. Koorenhoff phot. A. J. J. Wendel lith. P. W. M. Trap impr.

1, 2, 3, 4. *Pithechir melanurus* S. Müller.
c, g, k, l, n. *Strepsiceros strepsiceros* Pallas.